

**Proposed Tri-Party Agreement Modifications  
and Reference Documents for the**

**SINGLE-SHELL TANK WASTE RETRIEVAL ACTIONS  
(M-45-00-01A)**

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**Public Comment Period  
October 2 to November 17, 2000**



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# Changes Proposed to Hanford's Tri-Party Agreement



## Single-Shell Tank Waste Retrieval Actions, and Associated Leak Detection, Monitoring and Mitigation and Single-Shell Tank Farm Closure Activities

U.S. Department of Energy \* U.S. Environmental Protection Agency \* Washington State Department of Ecology

### Request for Public Comment

We need your review and/or comments on proposed modifications to Tri-Party Agreement milestones, target dates, and associated requirements for initial single-shell tank waste retrieval activities. The proposed changes establish new requirements governing single-shell tank retrieval activities before September 30, 2006, and represent work necessary to begin to achieve compliance with federal and state hazardous waste requirements. These actions focus on the completion of one full-scale demonstration of retrieval technology, the initiation of a second full scale retrieval demonstration, and retrieval of wastes from a follow-on single-shell tank. These actions will remove to safe storage no less than 800 curies of long-lived radioactive contaminants. Out of date and non-enforceable schedules for this time period within the TPA are deleted.

The public comment period for these proposed changes is October 2, 2000, through November 17, 2000. Following public comment, appropriate modifications will be made. All comments will be considered and a response to comments document prepared before final decisions are made. Because these proposed changes to the Tri-Party Agreement are within the existing project schedule and expected funding, public meetings are not currently scheduled. Should substantial public interest indicate a need for meetings, the Tri-Parties will respond accordingly.

#### Submit comments in writing to:

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U.S. Department of Energy  
Office of River Protection  
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Richland, WA 99352

Roger Stanley  
Washington State Department of Ecology  
P.O. Box 47600  
Olympia, WA 98504

E-mail: James\_E\_Jim\_Rasmussen@rl.gov E-mail: rost461@ecy.wa.gov

**Background:** The DOE Office of River Protection's mission is to safely store, retrieve, treat, and dispose of Hanford's 53 million gallons of high-level and hazardous waste presently contained in 177 aging underground tanks at Hanford. These tanks are regulated under Washington States Hazardous Waste Management Act. The 149 single-shell tanks (SSTs) do not meet Washington Administrative Code / Resource Conservation and Recovery Act requirements, e.g., they do not have adequate leak detection devices and do not have a double wall to contain the waste. The tank waste was produced during World War II and the Cold War to process plutonium.

The proposed modification deletes general and non-enforceable schedules within the current Tri-Party Agreement, and replaces them with specific enforceable requirements. These requirements include technology development and demonstration activities for SST waste retrieval and transfer of waste from the SST system into DOE's double-shell tank (DST) system. These activities are critical to ensure the retrieval of waste from SSTs in a timely and cost-effective manner.

**Initial Plan:** The Hanford Site single-shell tanks contain approximately 35 million gallons of waste, which must be retrieved from single-shell tanks and transferred to double-shell tanks. In 1994, the Tri-Party Agreement (TPA) was amended to specify that DOE would retrieve waste from single-shell tanks beginning in 2003 and initiate retrieval from 10 single-shell tanks by 2006. Waste would be retrieved from the remaining tanks

by 2018. The TPA did not specify retrieval technologies, however, it did recognize that waste retrieval from aging single-shell tanks posed technical challenges including the potential for loss of waste to the environment. These challenges would require DOE to demonstrate alternative retrieval technologies and develop and test methods to detect, monitor, and mitigate potential leaks during waste retrieval. In 1999, DOE completed interim waste retrieval from tank C-106. This retrieval action resolved a high-heat safety issue and demonstrated the use of "past-practice" sluicing to retrieve waste from a single-shell tank.

The ability to retrieve waste from single-shell tanks is contingent on the availability of double-shell tank space. Initial plans for waste retrieval were based, in part, on the startup of a waste treatment facility that was scheduled for late 2002. Under that scenario, as waste was removed from double-shell tanks for waste immobilization space would become available to support single-shell tank waste retrieval. Unfortunately, the startup date for a waste treatment facility has been delayed until late 2007. This delay constrains the ability to initiate bulk waste retrieval from single-shell tanks (available DST storage space is limited).

**Principal Issues:** Due to limited DST storage space Ecology and DOE's Office of River Protection have agreed to retrieve waste from fewer SSTs that contain more hazardous long-lived radioactive waste, instead of retrieving waste from 10 relatively empty SSTs. The Tri-Parties' tentative agreement establishes a risk-based strategy and initial actions necessary for DOE to demonstrate alternative single-shell tank waste retrieval technologies. The technologies are suitable to use in suspect or leaking SSTs to minimize the potential for large leak losses to the environment, and to develop performance and cost data necessary for application to future retrieval actions. These initial retrievals also include development and demonstration of leak detection, monitoring, and mitigation methods. In addition to demonstrating waste retrieval technologies, the initial actions will focus on single-shell tanks that pose the greatest risk to the environment and on maximizing available double-shell tank space. These initial actions and the information they provide regarding the capability of a variety of waste retrieval technologies will aid the parties during the negotiation of Tri-Party Agreement commitments and future retrieval actions.

**The New Strategy:** Key elements of the proposed milestone change include:

- Implement a risk-reduction strategy for SST waste retrieval ("worst tank waste" first)
- Demonstration of single-shell tank waste retrieval and leak detection, monitoring and mitigation technologies.
- Transfer of no less than 800 curies of long-lived, mobile radionuclides into approximately 2 million gallons of DST space for retrieval of S-112 and S-102
- Complete construction for tank C-104 retrieval action which will transfer approximately 23,000 curies of plutonium {approximately 17% of the total plutonium inventory in SSTs} into approximately 800,000 gallons of DST space.
- Update of the tank farm closure work plans.
- Assessment of options to create more tank space.

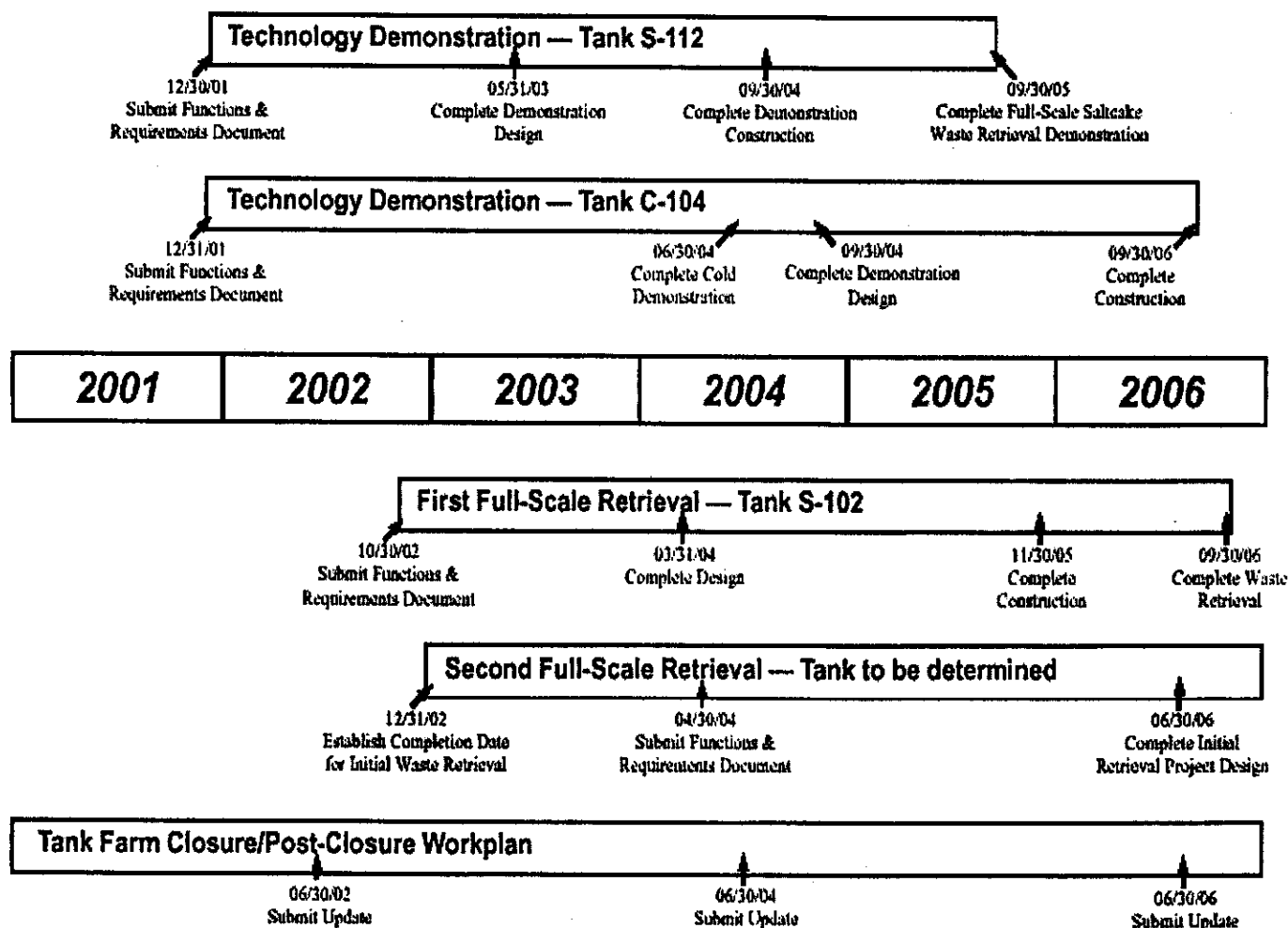
Future negotiations are scheduled in 2004 for SST waste retrieval activities after 2006. Information learned from these retrieval demonstrations will establish any appropriate schedule adjustments. Complete descriptions of the proposed milestones and specific information about the above items are available at Ecology and DOE websites

(<http://www.ecy.wa.gov/programs/nwp/index.html> and [www.hanford.gov/orp/index.html](http://www.hanford.gov/orp/index.html)) or at any of the Public Information Repository Locations listed below.

<b>Public Information Repository Locations</b>	
<b>Seattle</b> University of Washington Suzzallo Library Government Publications Room (206) 543-4664 ATTN: Eleanor Chase	<b>Richland</b> U.S. Department of Energy Public Reading Room WSU Consolidated Information Center, Room 101L 2770 University Drive (509) 376-8583 ATTN: Terri Traub
<b>Spokane</b> Gonzaga University Tri-Party Information Repository Foley Center East 502 Boone (509) 323-3839 ATTN: Connie Scappeli	<b>Portland</b> Portland State University, Bradford Price Millar Library Science and Engineering Floor Tri-Party Information Repository 934 SW Harrison and Park (503) 725-3690 ATTN: Michael Bowman
<b>Hanford Cleanup Toll-Free Line: 1-800-321-2008</b>	

For more information, call Suzanne Dahl, Washington State Department of Ecology, (509) 736-5705 or Bob Lober, U.S. Department of Energy-Office of River Protection, (509) 373-7949.

### Proposed Milestones for Retrieval Activities



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**CONCLUSION AGREEMENT ON NEGOTIATION OF REQUIREMENTS  
GOVERNING THE NEAR TERM RETRIEVAL OF WASTES FROM THE  
DEPARTMENT OF ENERGY'S SINGLE-SHELL TANKS  
(NEGOTIATIONS PURSUANT TO MILESTONE M-45-00A)**

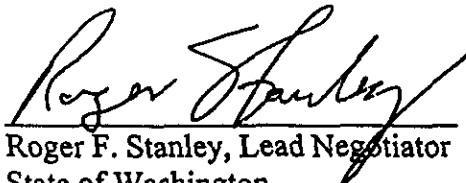
The State of Washington, Department of Ecology and the U. S. Department of Energy, in coordination with the U. S. Environmental Protection Agency (EPA) (hereafter the parties), have concluded the negotiation of near term requirements regarding the retrieval of single-shell tank wastes. These negotiations have been conducted pursuant to the Hanford Federal Facility Agreement and Consent Order (HFFACO) milestone M-45-00A "Complete Negotiation of Near Term (i.e., prior to 9/30/2006) SST Waste Retrieval Activities."

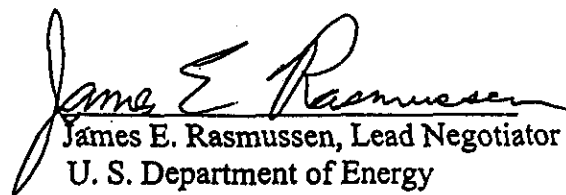
A tentative agreement has been reached and a package of changes to the HFFACO has been developed and found mutually acceptable. These proposed changes are attached to this Negotiation Conclusion Agreement. It is the intent of the parties that provisions in this agreement be performed as the change request is undergoing the process of finalization.

The parties' will submit the Tentative Agreement for a 45-day public comment period to run from approximately October 2, 2000 through November 17, 2000. Following the public comment period, the parties will jointly prepare responses to public comments that have been received. Should the parties not be able to resolve all issues arising as the result of the public comment period, unresolved matters shall be referred to dispute resolution under HFFACO Article VIII, and shall be initiated at the Inter-Agency Management Integration Team (IAMIT) level as described by the HFFACO.

The parties expect to approve final changes to the HFFACO by mid December 2000.

DATE: AUG 30 2000

  
Roger F. Stanley, Lead Negotiator  
State of Washington  
Department of Ecology

  
James E. Rasmussen, Lead Negotiator  
U. S. Department of Energy  
Office of River Protection



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<b>Change Number</b> <b>DRAFT</b> M-45-00-01A	<b>Federal Facility Agreement and Consent Order</b> <b>Change Control Form</b> Do not use blue ink. Type or print using black ink.	<b>Date</b> August 30, 2000
<b>Originator</b> USDOE & Ecology Negotiation Team <span style="float: right;"><b>Phone</b> N/A</span>		
<b>Class of Change</b> <input checked="" type="checkbox"/> I – Signatories <span style="margin-left: 100px;"><input type="checkbox"/> II – Executive Manager</span> <span style="margin-left: 100px;"><input type="checkbox"/> III – Project Manager</span>		
<b>Change Title</b> Modification of <u>Hanford Federal Facility Agreement and Consent Order</u> (Agreement) provisions governing near term Single-Shell Tank waste retrieval activities necessary for compliance with Washington's Hazardous Waste Management Act (HWMA).		
<b>Description/Justification of Change</b> <u>Introduction</u> This Agreement modification establishes near term Agreement milestones, target dates, and associated Agreement language governing single-shell tank (SST) waste retrieval activities prior to September 30, 2006, i.e., Agreement modifications necessary to achieve compliance with federal and state hazardous waste requirements. Ecology and USDOE have concluded negotiations and have submitted this M-45-001A change, the approval of which will establish / modify Agreement requirements. The near term strategy for SST waste retrieval activities has shifted from focusing on maximizing the number of tanks entered for retrieval (regardless of waste volume or content) to a focus on scheduling the retrieval of wastes from those SST's with a high volume of contaminants of concern. These contaminants are defined as mobile, long-lived radionuclides that have a potential of reaching the groundwater and Columbia River. The near term strategy also focuses on the performance of key retrieval technology demonstrations in a variety of waste forms and tank farm locations to establish a technical basis for future work. The near term work scope will also focus on the performance of risk assessments, incorporating vadose zone characterization data on a tank-by-tank basis, and on updating tank farm closure/post closure work plans. Modification scope includes but is not limited to completion of one "Limits of Technology" retrieval demonstration, initiation of a second "Limits of Technology" retrieval demonstration, and retrieval of sufficient SST waste containing an estimated 800 curies of contaminants of concern and occupying a minimum of 2 million gallons of DST space (per DOE, Best-Basis Inventory data, 8/01/2000).		
<b>Impact of Change</b> Work under this M-45-00-01A modification shall be managed through one unified schedule incorporating Agreement milestones and target dates, DOE (internal agency) milestones, and DOE contractor baseline. Modification of DOE contractor baseline(s) and issuance of associated DOE work directives and/or authorizations that are not consistent with Agreement requirements shall not be finalized prior to approval of an Agreement Change Control Form submitted pursuant to Action Plan Section 12.0. On approval of this M-45-00-01A change, Hanford site baselines, internal planning, management, and budget documents will be modified accordingly.		
<b>Affected Documents</b> The <u>Hanford Federal Facility Agreement and Consent Order</u> , as amended, DOE's annual Land Disposal Restrictions Report, and Hanford site internal planning, management, and budget documents (e.g., Agreement Action Plan, Appendix D, DOE and DOE contractor Baseline Change Control documents; Multi Year Work Plans; Sitewide Systems Engineering Control documents; Project Management Plans; and the Hanford Site Integrated Priority List (IPL). In addition, this submittal includes a new appendix to the Agreement (appendix H).		
<b>Approvals</b>		
		<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved
Ecology	Date	
		<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved
DOE-ORP	Date	
		<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved
DOE-RL	Date	
		<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved
EPA	Date	

Description/Justification of Change (Cont.)

The following modifications are hereby made to HFFACO major milestone series M-45-00 (Complete closure of all single-shell tank farms). Modifications made to existing HFFACO requirements are shown here as either **shaded new text** or **deleted strikethrough text** as follows:

<p>M-45-00</p> <p>LEAD AGENCY: ECOLOGY</p>	<p>COMPLETE CLOSURE OF ALL SINGLE SHELL TANK FARMS.</p> <p>CLOSURE WILL FOLLOW RETRIEVAL OF AS MUCH TANK WASTE AS TECHNICALLY POSSIBLE, WITH TANK WASTE RESIDUES NOT TO EXCEED 360 CUBIC FEET (CU. FT.) IN EACH OF THE 100 SERIES TANKS, 30 CU. FT. IN EACH OF THE 200 SERIES TANKS, OR THE LIMIT OF WASTE RETRIEVAL TECHNOLOGY CAPABILITY, WHICHEVER IS LESS. IF THE DOE BELIEVES THAT WASTE RETRIEVAL TO THESE LEVELS IS NOT POSSIBLE FOR A TANK, THEN DOE WILL SUBMIT A DETAILED EXPLANATION TO EPA AND ECOLOGY EXPLAINING WHY THESE LEVELS CANNOT BE ACHIEVED, AND SPECIFYING THE QUANTITIES OF WASTE THAT THE DOE PROPOSES TO LEAVE IN THE TANK. THE REQUEST WILL BE APPROVED OR DISAPPROVED BY EPA AND ECOLOGY ON A TANK-BY-TANK BASIS. PROCEDURES FOR MODIFYING THE RETRIEVAL CRITERIA LISTED ABOVE, AND FOR PROCESSING WAIVER REQUESTS ARE OUTLINED IN THE APPENDIX TO THIS CHANGE REQUEST.</p> <p>FOLLOWING COMPLETION OF RETRIEVAL, SIX OPERABLE UNITS (TANK FARMS), AS DESCRIBED IN APPENDIX C (200-BP-7, 200-PO-3, 200-RO-4, 200-TP-5, 200-TP-6, 200-UP-3), WILL BE REMEDIATED IN ACCORDANCE WITH THE APPROVED CLOSURE PLANS. FINAL CLOSURE OF THE OPERABLE UNITS (TANK FARMS) SHALL BE DEFINED AS REGULATORY APPROVAL OF COMPLETION OF CLOSURE ACTIONS AND COMMENCEMENT OF POST-CLOSURE ACTIONS.</p> <p>FOR THE PURPOSES OF THIS AGREEMENT ALL UNITS LOCATED WITHIN THE BOUNDARY OF EACH TANK FARM WILL BE CLOSED IN ACCORDANCE WITH WAC 173-303-610. THIS INCLUDES CONTAMINATED SOIL AND ANCILLARY EQUIPMENT THAT WERE PREVIOUSLY DESIGNATED AS RCRA PAST PRACTICE UNITS. ADOPTING THIS APPROACH WILL ENSURE EFFICIENT USE OF FUNDING AND WILL REDUCE POTENTIAL DUPLICATION OF EFFORT VIA APPLICATION OF DIFFERENT REGULATORY REQUIREMENTS: WAC 173-303-610 FOR CLOSURE OF THE TSD UNITS AND RCRA SECTION 3004(U) FOR REMEDIATION OF RCRA PAST PRACTICE UNITS.</p> <p>ALL PARTIES RECOGNIZE THAT THE RECLASSIFICATION OF PREVIOUSLY IDENTIFIED RCRA PAST PRACTICE UNITS TO ANCILLARY EQUIPMENT ASSOCIATED WITH THE TSD UNIT IS STRICTLY FOR APPLICATION OF A CONSISTENT CLOSURE APPROACH. UPGRADES TO PREVIOUSLY CLASSIFIED RCRA PAST PRACTICE UNITS TO ACHIEVE COMPLIANCE WITH RCRA OR DANGEROUS WASTE INTERIM STATUS TECHNICAL STANDARDS FOR TANK SYSTEMS (I.E., SECONDARY CONTAINMENT, INTEGRITY ASSESSMENTS, ETC.) WILL NOT BE MANDATED AS A RESULT OF THIS ACTION. HOWEVER, ANY EQUIPMENT MODIFIED OR REPLACED WILL MEET INTERIM STATUS STANDARDS. IN EVALUATING CLOSURE OPTIONS FOR SINGLE-SHELL TANKS, CONTAMINATED SOIL, AND ANCILLARY EQUIPMENT, ECOLOGY AND EPA WILL CONSIDER COST, TECHNICAL PRACTICABILITY, AND POTENTIAL EXPOSURE TO RADIATION. CLOSURE OF ALL UNITS WITHIN THE BOUNDARY OF A GIVEN TANK FARM WILL BE ADDRESSED IN A CLOSURE PLAN FOR THE SINGLE-SHELL TANKS.</p> <p>COMPLIANCE WITH THE WORK SCHEDULES SET FORTH IN THIS M-45 SERIES IS DEFINED AS THE PERFORMANCE OF SUFFICIENT WORK TO ASSURE WITH REASONABLE CERTAINTY THAT DOE WILL ACCOMPLISH SERIES M-45 MAJOR AND INTERIM MILESTONE REQUIREMENTS. NOTE: DOE HAS APPEALED THE ISSUE NOTED WITHIN THE PRECEDING SENTENCE TO THE WASHINGTON POLLUTION CONTROL HEARINGS BOARD. THE OUTCOME OF THIS APPEAL MAY AFFECT THIS M-45-00 LANGUAGE.</p> <p>DOE INTERNAL WORK SCHEDULES (E.G., DOE APPROVED SCHEDULE BASELINES) AND ASSOCIATED WORK DIRECTIVES AND AUTHORIZATIONS SHALL BE CONSISTENT WITH THE REQUIREMENTS OF THIS AGREEMENT. MODIFICATION OF DOE CONTRACTOR BASELINE(S) AND ISSUANCE OF ASSOCIATED DOE WORK DIRECTIVES AND/OR AUTHORIZATIONS THAT ARE NOT CONSISTENT WITH</p>	<p>9/30/2024</p>
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Description/Justification of Change (Cont.)

	AGREEMENT REQUIREMENTS SHALL NOT BE FINALIZED PRIOR TO APPROVAL OF AN AGREEMENT CHANGE REQUEST SUBMITTED PURSUANT TO AGREEMENT ACTION PLAN SECTION 12.0	
M-45-00A	<p>COMPLETE RENEGOTIATION OF "NEAR TERM" (I.E., PRIOR TO 9/30/2006) SST WASTE RETRIEVAL ACTIVITIES.</p> <p>THESE NEGOTIATIONS SHALL TAKE INTO ACCOUNT VARIABLES SUCH AS WORK IN PROGRESS, DOE'S DEVELOPING WASTE TREATMENT COMPLEX PRIVATIZATION INITIATIVE AND ENVIRONMENTAL AND HUMAN HEALTH RISKS ASSOCIATED WITH RELEASES FROM DOE'S SSTs. NEGOTIATIONS SHALL BE DESIGNED TO ESTABLISH A SUFFICIENT NUMBER OF AGREEMENT MILESTONES AND TARGET DATES TO EFFECTIVELY DRIVE EACH PHASE OF WORK INCLUDING BUT NOT LIMITED TO: 1.) WASTE RETRIEVAL TECHNOLOGY DEVELOPMENT (INCLUDING CONFINED SLUICING AND ROBOTIC TECHNOLOGIES), 2.) RETRIEVAL PERFORMANCE EVALUATIONS, 3.) LEAK DETECTION, MONITORING, AND MITIGATION, 4.) SELECTION OF SST RETRIEVAL SEQUENCE, AND 5.) DESIGN, CONSTRUCTION AND OPERATION OF SST WASTE RETRIEVAL SYSTEMS. THESE M-45-00A NEGOTIATIONS SHALL INCLUDE THE ESTABLISHMENT OF INTERIM MILESTONES FOR: A) INITIATION OF CONSTRUCTION, B) INITIATION OF RETRIEVAL, AND C) COMPLETION OF CONFINED SLUICING AT TANK C-104, AND D) INITIATION OF CONSTRUCTION OF A SALTCAKE DISSOLUTION AND RETRIEVAL SYSTEM, E) INITIATION OF RETRIEVAL, AND F) COMPLETION OF SALTCAKE WASTE RETRIEVAL AT TANK S-103.<sup>1</sup></p>	8/31/2000 (Completed)
M-45-00B	<p>COMPLETE "NEAR TERM" SST WASTE RETRIEVAL ACTIVITIES.</p> <p>UNTIL THE WASTE TREATMENT COMPLEX IS OPERATIONAL, THE AMOUNT OF DST SPACE AVAILABLE TO RECEIVE SST WASTE IS LIMITED. THE NEAR TERM FOCUS FOR SST WASTE RETRIEVAL WILL INCLUDE MAXIMIZING THE TRANSFER OF CONTAMINANTS OF CONCERN (LONG-LIVED, MOBILE RADIONUCLIDES) INTO THE DST SYSTEM. WORK UNDER THIS MILESTONE ALSO INCLUDES COMPLETION OF ONE "LIMITS OF TECHNOLOGY" RETRIEVAL DEMONSTRATION, INITIATION OF A SECOND "LIMITS OF TECHNOLOGY" RETRIEVAL DEMONSTRATION, AND RETRIEVAL OF SUFFICIENT SST WASTE CONTAINING NO LESS THAN 800 CURIES OF CONTAMINANTS OF CONCERN AND OCCUPYING A MINIMUM OF 2 MILLION GALLONS OF DST SPACE (PER DOE BEST-BASIS INVENTORY DATA, 8/01/2000). "LIMITS OF TECHNOLOGY" RETRIEVAL DEMONSTRATIONS WILL SEEK TO IMPROVE UPON PAST PRACTICE SLUICING (PPS) BASELINE TECHNOLOGY INCLUDING BUT NOT LIMITED TO RETRIEVAL EFFICIENCY, LEAK LOSS DURING RETRIEVAL, AND LEAK DETECTION MITIGATION AND MONITORING (LDMM).</p> <p>PROCEDURES FOR MODIFYING THE RETRIEVAL CRITERIA LISTED WITHIN THE ASSOCIATED MILESTONES, AND FOR PROCESSING WAIVER REQUESTS ARE OUTLINED IN A NEW APPENDIX "H" TO THE AGREEMENT. THE APPENDIX IS ATTACHED TO THIS CHANGE REQUEST.</p>	9/30/2006
M-45-02	<p>SUBMIT ANNUAL UPDATES TO SST RETRIEVAL SEQUENCE DOCUMENT.</p> <p>THIS PROVIDES FOR AN ANNUAL UPDATE OF A SST RETRIEVAL SEQUENCE DOCUMENT THAT WILL DEFINE THE TANK RETRIEVAL SEQUENCE, SELECTION CRITERIA AND, TANK SELECTION RATIONALE, REFERENCE RETRIEVAL METHOD(S) FOR EACH TANK, AND THE ESTIMATED RETRIEVAL SCHEDULES. THE RETRIEVAL SEQUENCE DOCUMENT WILL DETAIL RETRIEVAL METHODOLOGIES TO BE EMPLOYED AND ESTIMATED WASTE VOLUMES TO BE GENERATED DURING RETRIEVAL (TO BE TRANSFERRED TO THE DST'S OR OTHER AVAILABLE SAFE STORAGE). THE REPORT WILL ALSO DETAIL TANK SELECTION RATIONALE BASED ON THE PRIMARY OBJECTIVE OF MAXIMIZING RISK REDUCTION THROUGH THE RETRIEVAL OF MOBILE, LONG-LIVED RADIONUCLIDES AND PRINCIPLE NON RADIOLOGICAL HAZARDOUS CONSTITUENTS IN A MANNER WHICH IS SENSITIVE TO WASTE TREATMENT FACILITY REQUIREMENTS AND INFRASTRUCTURE CONSTRAINTS. THE ANNUAL UPDATES WILL BE SUBMITTED TO ECOLOGY FOR APPROVAL AS AGREEMENT PRIMARY DOCUMENTS.</p>	9/30/2000 and annually thereafter.

<sup>1</sup> During the conduct of these negotiations, the parties agreed to two basic modifications to these requirements i.e., 1) To base milestones established on completions (e.g. complete construction), and 2) To re-order tanks selected for early retrieval in order to maximize risk reduction and cost efficiency.

Description/Justification of Change (Cont.)

M-45-02E	SUBMIT ANNUAL UPDATE OF SST RETRIEVAL SEQUENCE DOCUMENT FOR ECOLOGY APPROVAL. (SEE TEXT OF M-45-02 FOR ADDITIONAL DETAILS).	9/30/2000
M-45-00B M-45-00C	<p>COMPLETE RENEGOTIATION OF SECOND PHASE (I.E., 9/30/2006 THROUGH 9/30/2015) SST WASTE RETRIEVAL ACTIVITIES.</p> <p>THESE NEGOTIATIONS SHALL TAKE INTO ACCOUNT VARIABLES SUCH AS WORK IN PROGRESS, E.G., DOE'S DEVELOPING "PRIVATIZATION" TANK WASTE TREATMENT COMPLEX ACQUISITION INITIATIVE AND ENVIRONMENTAL AND HUMAN HEALTH RISKS ASSOCIATED WITH RELEASES FROM DOE'S SSTs. NEGOTIATIONS SHALL BE DESIGNED TO ESTABLISH A SUFFICIENT NUMBER OF AGREEMENT MILESTONES AND TARGET DATES TO EFFECTIVELY DRIVE EACH PHASE OF WORK INCLUDING BUT NOT LIMITED TO: 1.) WASTE RETRIEVAL TECHNOLOGY DEVELOPMENT, 2.) RETRIEVAL PERFORMANCE EVALUATIONS, 3.) LEAK DETECTION, MONITORING, AND MITIGATION, 4.) SELECTION OF SST RETRIEVAL SEQUENCE, 5.) DESIGN, CONSTRUCTION AND OPERATION OF SST WASTE RETRIEVAL SYSTEMS, AND 6.) CLOSURE PLANNING AND CLOSURE PLAN DEVELOPMENT.</p> <p>DOE, AND DOE'S CONTRACTOR(S) WILL RETRIEVE AND TRANSFER SST WASTES INTO THE DST SYSTEM AS SOON AS SPACE IS MADE AVAILABLE, ALLOWING DST SPACE FOR TREATMENT PLANT FEED STAGING AND SAFETY ISSUE RESOLUTION. TRANSFER OF SST WASTE WILL BE MADE ONCE SUFFICIENT DST SYSTEM SPACE IS AVAILABLE TO ALLOW A TRANSFER OF AN OPERATIONALLY PRACTICABLE VOLUME OF WASTE. SST WASTE WILL BE RETRIEVED ON A PRIORITY BASIS WITH THE GOALS OF REDUCING ENVIRONMENTAL RISK AND TREATMENT PROCESS OPTIMIZATION. DOE AND ECOLOGY WILL AGREE ON THE CRITERIA TO DETERMINE ENVIRONMENTAL RISK REDUCTION.</p>	2/28/2004 <sup>2</sup>
M-45-02F	SUBMIT ANNUAL UPDATE OF SST RETRIEVAL SEQUENCE DOCUMENT FOR ECOLOGY APPROVAL. (SEE TEXT OF M-45-02 FOR ADDITIONAL DETAILS).	9/30/2001
M-45-02G	SUBMIT ANNUAL UPDATE OF SST RETRIEVAL SEQUENCE DOCUMENT FOR ECOLOGY APPROVAL. (SEE TEXT OF M-45-02 FOR ADDITIONAL DETAILS).	9/30/2002
M-45-02H	SUBMIT ANNUAL UPDATE OF SST RETRIEVAL SEQUENCE DOCUMENT FOR ECOLOGY APPROVAL. (SEE TEXT OF M-45-02 FOR ADDITIONAL DETAILS).	9/30/2003
M-45-02I	SUBMIT ANNUAL UPDATE OF SST RETRIEVAL SEQUENCE DOCUMENT FOR ECOLOGY APPROVAL. (SEE TEXT OF M-45-02 FOR ADDITIONAL DETAILS).	9/30/2004 and annually thereafter
M-45-03-T01	<p>COMPLETE SST WASTE RETRIEVAL DEMONSTRATION.</p> <p>INITIATE AND COMPLETE A FULL SCALE DEMONSTRATION OF SST RETRIEVAL TECHNOLOGY. THIS DEMONSTRATION WILL BE CONSIDERED COMPLETE WHEN NO LESS THAN 99% OF THE WASTE INVENTORY IS REMOVED FROM THE TANK.</p>	9/30/2003
M-45-03C	COMPLETE FULL SCALE SALTCAKE WASTE RETRIEVAL TECHNOLOGY DEMONSTRATION AT SINGLE-SHELL TANK S-112. WASTE SHALL BE RETRIEVED TO THE DST SYSTEM TO THE LIMITS OF THE TECHNOLOGY (OR TECHNOLOGIES) SELECTED. SELECTED SALTCAKE RETRIEVAL TECHNOLOGY (OR TECHNOLOGIES) MUST SEEK TO IMPROVE UPON THE PAST-PRACTICE SLUICING BASELINE IN THE AREAS OF EXPECTED RETRIEVAL EFFICIENCY, LEAK LOSS POTENTIAL, AND SUITABILITY FOR USE IN POTENTIALLY LEAKING TANKS. THIS DEMONSTRATION SHALL ALSO INCLUDE THE INSTALLATION AND IMPLEMENTATION OF FULL SCALE LEAK DETECTION, MONITORING, AND MITIGATION (LDMM) TECHNOLOGIES. THE PARTIES RECOGNIZE AND AGREE THAT THIS ACTION IS FOR DEMONSTRATION AND INITIAL WASTE RETRIEVAL PURPOSES. COMPLETION OF THIS DEMONSTRATION SHALL BE BY WRITTEN APPROVAL OF DOE AND ECOLOGY.	9/30/2005

<sup>2</sup> These negotiations will also consider the need for additional compliant storage space. Should DOE fail to initiate construction of the Phase I Hanford Tank Waste Treatment Complex by December 31, 2001, as defined in Agreement interim milestone M-62-06, the due date for this M-45-00C milestone shall be automatically adjusted to 4/30/2002.

## Description/Justification of Change (Cont.)

	GOALS OF THIS DEMONSTRATION SHALL INCLUDE THE RETRIEVAL TO SAFE STORAGE OF APPROXIMATELY 550 CURIES OF MOBILE, LONG-LIVED RADIOISOTOPES AND 99% OF TANK CONTENTS BY VOLUME (PER DOE BEST BASIS INVENTORY DATA, 8/01/2000).	
M-45-03-T03	<p>SUBMIT S-112 SALTCAKE WASTE RETRIEVAL TECHNOLOGY DEMONSTRATION FUNCTIONS AND REQUIREMENTS DOCUMENT.</p> <p>THIS DOCUMENT WILL ESTABLISH DEMONSTRATION SYSTEM SPECIFICATIONS (INCLUDING LDMM SYSTEM SPECIFICATIONS) AND WILL ALSO INCLUDE A SCOPING LEVEL RETRIEVAL PERFORMANCE EVALUATION (RPE). THE FUNCTIONS AND REQUIREMENTS DOCUMENT AND ITS ASSOCIATED RPE SHALL PROVIDE ENVIRONMENTAL AND HUMAN HEALTH RISK EVALUATION DATA/INFORMATION ASSOCIATED WITH ESTIMATED WASTE VOLUMES TO BE RETRIEVED, THE MAXIMUM VOLUME WHICH COULD LEAK DURING RETRIEVAL, AND RISK FROM RESIDUAL WASTE. THIS DOCUMENT WILL DETAIL KNOWN AND ESTIMATED RADIONUCLIDE CONTAMINATION AND CONTAMINANT MIGRATION WITHIN THE VADOSE ZONE AS BASES OF CALCULATION. LDMM AND RPE DOCUMENTATION PROVIDED WILL BE ADEQUATE TO ALLOW ECOLOGY TO ASSESS THE ADEQUACY OF THE DEMONSTRATION SYSTEMS. THIS DOCUMENT WILL INCORPORATE LESSONS LEARNED, INCLUDING LDMM, RETRIEVAL, INSTRUMENTATION, AND OPERATIONAL EXPERIENCE FROM PREVIOUS DOE AND INDUSTRY RELATED RETRIEVAL PROJECTS. DOE WILL SUBMIT ITS S-112 LDMM STRATEGY AS PART OF THE FUNCTIONS AND REQUIREMENTS DOCUMENT PRIOR TO INITIATION OF DESIGN. THE S-112 FUNCTIONS AND REQUIREMENTS DOCUMENT WILL BE SUBMITTED FOR ECOLOGY APPROVAL AS AN AGREEMENT PRIMARY DOCUMENT.</p> <p>THIS FUNCTIONS AND REQUIREMENTS DOCUMENT WILL BE TIMELY SUBMITTED SO THAT PROJECT CRITICAL PATH IS NOT AFFECTED, AND SO AS TO ALLOW ADEQUATE TIME FOR DOE AND ECOLOGY REVIEW, REVISION AND APPROVAL.</p>	12/30/2001
M-45-03D	<p>COMPLETE S-112 SALTCAKE WASTE RETRIEVAL TECHNOLOGY DEMONSTRATION DESIGN (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING DESIGN AND OPERATING STRATEGIES NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION (LDMM)).</p> <p>DESIGN WILL BE CONSIDERED COMPLETE WHEN 90% OF THE DESIGN HAS BEEN APPROVED FOR FABRICATION AND/OR CONSTRUCTION.</p>	5/31/2003
M-45-03E	<p>COMPLETE S-112 SALTCAKE WASTE RETRIEVAL TECHNOLOGY DEMONSTRATION CONSTRUCTION (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING THOSE NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION).</p> <p>CONSTRUCTION WILL BE CONSIDERED COMPLETE WHEN ALL PROCESS EQUIPMENT IS INSTALLED AND ACCEPTANCE TESTS ARE COMPLETED.</p>	9/30/2004
M-45-03F	<p>COMPLETE FULL SCALE SLUDGE/HARD HEEL, CONFINED SLUICING AND ROBOTIC TECHNOLOGIES, WASTE RETRIEVAL DEMONSTRATION AT TANK C-104.</p> <p>WASTE SHALL BE RETRIEVED TO THE DST SYSTEM TO THE LIMITS OF THE TECHNOLOGY (OR TECHNOLOGIES) SELECTED. SELECTED SLUDGE/HARD HEEL TECHNOLOGY (OR TECHNOLOGIES) MUST SEEK TO IMPROVE UPON THE PAST PRACTICE SLUICING BASELINE IN THE AREAS OF EXPECTED RETRIEVAL EFFICIENCY, LEAK LOSS POTENTIAL, AND SUITABILITY FOR USE IN POTENTIALLY LEAKING TANKS. CONFINED SLUICING IS DEFINED AS THE LOCALIZED ADDITION AND RETRIEVAL OF LIQUIDS AND WASTE. THIS DEMONSTRATION SHALL ALSO INCLUDE THE INSTALLATION AND IMPLEMENTATION OF FULL SCALE LEAK DETECTION, MONITORING, AND MITIGATION (LDMM) TECHNOLOGIES. THE PARTIES RECOGNIZE AND AGREE THAT THIS ACTION IS FOR DEMONSTRATION AND INITIAL WASTE RETRIEVAL PURPOSES. COMPLETION OF THIS DEMONSTRATION SHALL BE BY APPROVAL OF DOE AND ECOLOGY.</p> <p>GOALS OF THIS DEMONSTRATION SHALL INCLUDE THE RETRIEVAL TO SAFE STORAGE OF APPROXIMATELY 89 KG OF PLUTONIUM WHICH REPRESENTS</p>	<p>TBE</p> <p>(This milestone date shall be established during the parties' M-45-00C negotiations.)</p>

Description/Justification of Change (Cont.)

	APPROXIMATELY 17% OF THE TOTAL PLUTONIUM INVENTORY WITHIN THE SST SYSTEM), AND 99% OF TANK CONTENTS BY VOLUME (PER DOE'S BEST-BASIS INVENTORY DATA OF 8/01/2000).	
M-45-03-T04	<p>SUBMIT C-104 SLUDGE/HARD HEEL, CONFINED SLUICING AND ROBOTIC TECHNOLOGIES, WASTE RETRIEVAL DEMONSTRATION FUNCTIONS AND REQUIREMENTS DOCUMENT.</p> <p>THIS DOCUMENT WILL ESTABLISH DEMONSTRATION SYSTEM SPECIFICATIONS (INCLUDING LDMM SYSTEM SPECIFICATIONS) AND WILL ALSO INCLUDE A SCOPING LEVEL RETRIEVAL PERFORMANCE EVALUATION (RPE). THE FUNCTIONS AND REQUIREMENTS DOCUMENT AND ITS ASSOCIATED RPE SHALL PROVIDE ENVIRONMENTAL AND HUMAN HEALTH RISK EVALUATION DATA/INFORMATION ASSOCIATED WITH ESTIMATED WASTE VOLUMES TO BE RETRIEVED, THE MAXIMUM VOLUME WHICH COULD LEAK DURING RETRIEVAL, AND RISK FROM RESIDUAL WASTE. THIS DOCUMENT WILL DETAIL KNOWN AND ESTIMATED RADIONUCLIDE CONTAMINATION AND CONTAMINANT MIGRATION WITHIN THE VADOSE ZONE AS BASES OF CALCULATION. LDMM AND RPE DOCUMENTATION PROVIDED WILL BE ADEQUATE TO ALLOW ECOLOGY TO ASSESS THE ADEQUACY OF THE DEMONSTRATION SYSTEMS. THIS DOCUMENT WILL INCORPORATE LESSONS LEARNED, INCLUDING LDMM, RETRIEVAL, INSTRUMENTATION, AND OPERATIONAL EXPERIENCE FROM PREVIOUS DOE AND INDUSTRY RELATED RETRIEVAL PROJECTS. DOE WILL SUBMIT ITS C-104 LDMM STRATEGY AS PART OF THE FUNCTIONS AND REQUIREMENTS DOCUMENT, PRIOR TO INITIATION OF DESIGN. THIS DOCUMENT WILL BE SUBMITTED FOR ECOLOGY APPROVAL AS AN AGREEMENT PRIMARY DOCUMENT.</p> <p>THIS FUNCTIONS AND REQUIREMENTS DOCUMENT WILL BE TIMELY SUBMITTED SO THAT PROJECT CRITICAL PATH IS NOT AFFECTED, AND SO AS TO ALLOW ADEQUATE TIME FOR DOE AND ECOLOGY REVIEW, REVISION AND APPROVAL.</p>	12/31/2001
M-45-03G	<p>COMPLETE C-104 SLUDGE/HARD HEEL, CONFINED SLUICING AND ROBOTIC TECHNOLOGIES, WASTE RETRIEVAL COLD DEMONSTRATION.</p> <p>THIS FULL SCALE DEMONSTRATION WILL BE SUFFICIENT TO SUPPORT FINAL DESIGN AND TESTING OF ALL EQUIPMENT, INCLUDING THE LDMM APPROACH USED IN THE ACTUAL SYSTEM. THE DEMONSTRATION MUST ESTABLISH THE PERFORMANCE OF THE EQUIPMENT SPECIFIED IN THE FUNCTIONS AND REQUIREMENTS DOCUMENT. A LETTER REPORT WILL BE SUBMITTED TO ECOLOGY TO DOCUMENT THE RESULTS OF THE COLD DEMONSTRATION.</p>	6/30/2004
M-45-03H	<p>COMPLETE C-104 SLUDGE/HARD HEEL, CONFINED SLUICING AND ROBOTIC TECHNOLOGIES, WASTE RETRIEVAL DEMONSTRATION DESIGN (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING DESIGN AND OPERATING STRATEGIES NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION (LDMM)).</p> <p>DESIGN WILL BE CONSIDERED COMPLETE WHEN 90% OF THE DESIGN HAS BEEN APPROVED FOR FABRICATION AND/OR CONSTRUCTION.</p>	9/30/2004
M-45-03I	<p>COMPLETE C-104 SLUDGE/HARD HEEL, CONFINED SLUICING AND ROBOTIC TECHNOLOGIES, WASTE RETRIEVAL DEMONSTRATION CONSTRUCTION (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING THOSE NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION).</p> <p>CONSTRUCTION WILL BE CONSIDERED COMPLETE WHEN ALL PROCESS EQUIPMENT IS INSTALLED AND ACCEPTANCE TESTS ARE COMPLETED.</p>	9/30/2006
M-45-04-T01	<p>PROVIDE INITIAL SINGLE SHELL TANK RETRIEVAL SYSTEMS.</p> <p>COMPLETE CONSTRUCTION AND RELATED TESTING OF THE INITIAL SST RETRIEVAL SYSTEMS. THIS MILESTONE WILL PROVIDE RETRIEVAL SYSTEMS FOR AN ENTIRE SINGLE SHELL TANK FARM OR AN EQUIVALENT NUMBER OF TANKS.</p>	11/30/2003
M-45-04-T02	COMPLETE DESIGN FOR THE INITIAL SST RETRIEVAL SYSTEMS.	12/31/2000
M-45-04-T03	COMPLETE CONSTRUCTION FOR THE INITIAL SST RETRIEVAL SYSTEMS.	6/30/2003

Description/Justification of Change (Cont.)

M-45-05	<p>RETRIEVE WASTE FROM ALL REMAINING SINGLE-SHELL TANKS.</p> <p>COMPLETE WASTE RETRIEVAL FROM ALL REMAINING SINGLE-SHELL TANKS. RETRIEVAL STANDARDS AND COMPLETION DEFINITIONS ARE PROVIDED UNDER THE MAJOR MILESTONE. THE SCHEDULE REFLECTS RETRIEVAL ACTIVITIES ON A FARM-BY-FARM BASIS. IT ALSO ALLOWS FLEXIBILITY TO RETRIEVE TANKS FROM VARIOUS FARMS IF DESIRED TO SUPPORT SAFETY ISSUE RESOLUTION, PRETREATMENT OR DISPOSAL FEED REQUIREMENTS, OR OTHER PRIORITIES.</p>	9/30/2018
M-45-05-T01	INITIATE TANK WASTE RETRIEVAL FROM ONE SINGLE SHELL TANK.	12/31/2003
M-45-05-T02	INITIATE TANK RETRIEVAL FROM TWO ADDITIONAL SINGLE SHELL TANKS.	9/30/2004
M-45-05-T03	INITIATE TANK RETRIEVAL FROM THREE ADDITIONAL SINGLE SHELL TANKS.	9/30/2005
M-45-05-T04	INITIATE TANK RETRIEVAL FROM FOUR ADDITIONAL SINGLE SHELL TANKS.	9/30/2006
M-45-05A	<p>COMPLETE INITIAL WASTE RETRIEVAL FROM TANK S-102.</p> <p>THE S-102 INITIAL WASTE RETRIEVAL TECHNOLOGY (OR TECHNOLOGIES) WILL BE SELECTED BASED ON THE PRINCIPLE CRITERIA OF MAXIMIZING THE RETRIEVAL OF MOBILE, LONG-LIVED RADIOISOTOPES AND NON-RADIOLOGICAL HAZARDOUS CONSTITUENTS. THE PARTIES RECOGNIZE AND AGREE THAT THIS ACTION IS FOR INITIAL WASTE RETRIEVAL PURPOSES. COMPLETION OF THIS INITIAL RETRIEVAL SHALL BE BY APPROVAL OF DOE AND ECOLOGY.</p> <p>GOALS OF THIS INITIAL WASTE RETRIEVAL PROJECT SHALL INCLUDE THE RETRIEVAL TO SAFE STORAGE OF APPROXIMATELY 490 CURIES OF MOBILE, LONG-LIVED RADIOISOTOPES AND 99% OF TANK CONTENTS BY VOLUME (PER DOE BEST-BASIS INVENTORY DATA, 8/01/2000).</p> <p>COMPLETION OF S-102 INITIAL WASTE RETRIEVAL IS SUBJECT TO SAFE STORAGE SPACE AVAILABILITY CONSISTENT WITH M-45-00B.</p>	9/30/2006
M-45-05-T16	<p>SUBMIT S-102 INITIAL WASTE RETRIEVAL FUNCTIONS AND REQUIREMENTS DOCUMENT.</p> <p>THIS DOCUMENT WILL ESTABLISH DEMONSTRATION SYSTEM SPECIFICATIONS (INCLUDING LDMM SYSTEM SPECIFICATIONS) AND WILL ALSO INCLUDE A SCOPING LEVEL RETRIEVAL PERFORMANCE EVALUATION (RPE). THE FUNCTIONS AND REQUIREMENTS DOCUMENT AND ITS ASSOCIATED RPE SHALL ALSO PROVIDE ENVIRONMENTAL AND HUMAN HEALTH RISK EVALUATION DATA/INFORMATION ASSOCIATED WITH ESTIMATED WASTE VOLUMES TO BE RETRIEVED, THE MAXIMUM VOLUME WHICH COULD LEAK DURING RETRIEVAL, AND RISK FROM RESIDUAL WASTE. THIS DOCUMENT WILL DETAIL KNOWN AND ESTIMATED RADIONUCLIDE CONTAMINATION AND CONTAMINANT MIGRATION WITHIN THE VADOSE ZONE AS BASES OF CALCULATION. LDMM AND RPE DOCUMENTATION PROVIDED WILL BE ADEQUATE TO ALLOW ECOLOGY TO ASSESS THE ADEQUACY OF THE DEMONSTRATION SYSTEMS. THIS DOCUMENT WILL INCORPORATE LESSONS LEARNED, INCLUDING LDMM, RETRIEVAL, INSTRUMENTATION, AND OPERATIONAL EXPERIENCE FROM PREVIOUS DOE AND INDUSTRY RELATED RETRIEVAL PROJECTS. DOE WILL SUBMIT ITS S-102 LDMM STRATEGY AS PART OF THE FUNCTIONS AND REQUIREMENTS DOCUMENT, PRIOR TO INITIATION OF DESIGN. THIS DOCUMENT WILL BE SUBMITTED FOR ECOLOGY APPROVAL AS AN AGREEMENT PRIMARY DOCUMENT.</p> <p>THIS FUNCTIONS AND REQUIREMENTS DOCUMENT WILL BE TIMELY SUBMITTED SO THAT PROJECT CRITICAL PATH IS NOT AFFECTED, AND SO AS TO ALLOW ADEQUATE TIME FOR DOE AND ECOLOGY REVIEW, REVISION AND APPROVAL.</p>	10/30/2002
M-45-05B	<p>COMPLETE S-102 INITIAL RETRIEVAL PROJECT DESIGN (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING DESIGN AND OPERATING STRATEGIES NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION (LDMM))</p> <p>THE DESIGN WILL BE CONSIDERED COMPLETE WHEN 90% OF THE DESIGN HAS</p>	3/31/2004



Description/Justification of Change (Cont.)

	BEEN APPROVED FOR FABRICATION AND/OR CONSTRUCTION.	
M-45-05C	<p>COMPLETE S-102 INITIAL WASTE RETRIEVAL PROJECT CONSTRUCTION (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING THOSE NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION).</p> <p>CONSTRUCTION WILL BE CONSIDERED COMPLETE WHEN ALL PROCESS EQUIPMENT IS INSTALLED AND ACCEPTANCE TESTS ARE COMPLETED.</p>	11/30/2005
M-45-05D	<p>ESTABLISH COMPLETION DATE FOR THE SECOND TANK, INITIAL WASTE RETRIEVAL.</p> <p>THIS SECOND FULL SCALE INITIAL WASTE RETRIEVAL PROJECT WILL BE CONDUCTED UNDER THE ONGOING CRITERIA OF MAXIMIZING THE RETRIEVAL TO SAFE STORAGE OF MOBILE, LONG LIVED RADIOISOTOPES AND PRINCIPLE NON-RADIOLOGICAL HAZARDOUS CONSTITUENTS. COMPLETION OF THIS INITIAL RETRIEVAL MILESTONE SHALL BE BY APPROVAL OF DOE AND ECOLOGY.</p>	12/31/2002
M-45-05-T17	<p>SUBMIT SECOND TANK INITIAL WASTE RETRIEVAL FUNCTIONS AND REQUIREMENTS DOCUMENT.</p> <p>THIS DOCUMENT WILL ESTABLISH DEMONSTRATION SYSTEM SPECIFICATIONS (INCLUDING LDMM SYSTEM SPECIFICATIONS) AND WILL ALSO INCLUDE A SCOPING LEVEL RETRIEVAL PERFORMANCE EVALUATION (RPE). THE FUNCTIONS AND REQUIREMENTS DOCUMENT AND ITS ASSOCIATED RPE SHALL ALSO PROVIDE ENVIRONMENTAL AND HUMAN HEALTH RISK EVALUATION DATA/INFORMATION ASSOCIATED WITH ESTIMATED WASTE VOLUMES TO BE RETRIEVED, THE MAXIMUM VOLUME WHICH COULD LEAK DURING RETRIEVAL, AND RISK FROM RESIDUAL WASTE. THIS DOCUMENT WILL DETAIL KNOWN AND ESTIMATED RADIONUCLIDE CONTAMINATION AND CONTAMINANT MIGRATION WITHIN THE VADOSE ZONE AS BASES OF CALCULATION. LDMM AND RPE DOCUMENTATION PROVIDED WILL BE ADEQUATE TO ALLOW ECOLOGY TO ASSESS THE ADEQUACY OF THE DEMONSTRATION SYSTEMS. THIS DOCUMENT WILL INCORPORATE LESSONS LEARNED INCLUDING LDMM, RETRIEVAL, INSTRUMENTATION, AND OPERATIONAL EXPERIENCE FROM PREVIOUS DOE AND INDUSTRY RELATED RETRIEVAL PROJECTS. DOE WILL SUBMIT ITS LDMM STRATEGY AS PART OF THE FUNCTIONS AND REQUIREMENTS DOCUMENT, PRIOR TO INITIATION OF DESIGN. THIS DOCUMENT WILL BE SUBMITTED FOR ECOLOGY APPROVAL AS AN AGREEMENT PRIMARY DOCUMENT.</p> <p>THIS FUNCTIONS AND REQUIREMENTS DOCUMENT WILL BE TIMELY SUBMITTED SO THAT PROJECT CRITICAL PATH IS NOT AFFECTED, AND SO AS TO ALLOW ADEQUATE TIME FOR DOE AND ECOLOGY REVIEW, REVISION AND APPROVAL.</p>	4/30/2004
M-45-05E	<p>COMPLETE SECOND TANK INITIAL RETRIEVAL PROJECT DESIGN (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING DESIGN AND OPERATING STRATEGIES NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION (LDMM)).</p> <p>THE DESIGN WILL BE CONSIDERED COMPLETE WHEN 90% OF THE DESIGN HAS BEEN APPROVED FOR FABRICATION AND/OR CONSTRUCTION.</p>	6/30/2006
M-45-05F	<p>COMPLETE SECOND INITIAL WASTE RETRIEVAL PROJECT CONSTRUCTION (TO INCLUDE ALL PHYSICAL SYSTEMS INCLUDING THOSE NECESSARY FOR LEAK DETECTION MONITORING AND MITIGATION).</p> <p>CONSTRUCTION WILL BE CONSIDERED COMPLETE WHEN ALL PROCESS EQUIPMENT IS INSTALLED AND ACCEPTANCE TESTS ARE COMPLETED.</p>	TBE (Specific tank identification and this milestone date shall be established no later than 12/31/02.)
M-45-05-T05	INITIATE TANK RETRIEVAL FROM FIVE ADDITIONAL SINGLE-SHELL TANKS.	9/30/2007
M-45-05-T06	INITIATE TANK RETRIEVAL FROM FIVE ADDITIONAL SINGLE-SHELL TANKS.	9/30/2008
M-45-05-T07	INITIATE TANK RETRIEVAL FROM SEVEN ADDITIONAL SINGLE-SHELL TANKS.	9/30/2009
M-45-05-T08	INITIATE TANK RETRIEVAL FROM EIGHT ADDITIONAL SINGLE-SHELL TANKS.	9/30/2010

Description/Justification of Change (Cont.)

M-45-00C M-45-00D	<p>COMPLETE RENEGOTIATION OF THE REMAINDER OF THE SST WASTE RETRIEVAL AND CLOSURE PROGRAM.</p> <p>THESE NEGOTIATIONS WILL ESTABLISH REGULATORY REQUIREMENTS FOR THE REMAINDER OF THE SST WASTE RETRIEVAL AND CLOSURE PROGRAM (THROUGH COMPLETION OF CLOSURE AT ALL SINGLE SHELL TANK FARMS). NEGOTIATIONS WILL INCLUDE MODIFICATION AS MAY BE NECESSARY OF COMPLETION DATES FOR SST WASTE RETRIEVAL AND SST FARM CLOSURE BASED ON EXPERIENCE GAINED FROM SST AND DST WASTE RETRIEVAL WORK COMPLETED, CORRECTIVE ACTIONS, PHASE I TREATMENT COMPLEX OPERATIONS, PHASE II TREATMENT PLANNING, KNOWN AND LIKELY VADOSE ZONE AND GROUNDWATER IMPACTS, AND OTHER AVAILABLE ENVIRONMENTAL IMPACT INFORMATION.</p> <p>DOE, AND DOE'S CONTRACTOR(S) WILL RETRIEVE AND TRANSFER SST WASTES INTO THE DST SYSTEM AS SOON AS SPACE IS MADE AVAILABLE, ALLOWING DST SPACE FOR TREATMENT PLANT FEED STAGING AND SAFETY ISSUE RESOLUTION. TRANSFER OF SST WASTE WILL BE MADE ONCE SUFFICIENT DST SYSTEM SPACE IS AVAILABLE TO ALLOW A TRANSFER OF AN OPERATIONALLY PRACTICABLE VOLUME OF WASTE. SST WASTE WILL BE RETRIEVED ON A PRIORITY BASIS WITH THE GOALS OF REDUCING ENVIRONMENTAL RISK AND TREATMENT PROCESS OPTIMIZATION. DOE AND ECOLOGY WILL AGREE ON THE CRITERIA TO DETERMINE ENVIRONMENTAL RISK REDUCTION.</p>	6/30/2011
M-45-05-T09	INITIATE TANK RETRIEVAL FROM TEN ADDITIONAL SINGLE-SHELL TANKS.	9/30/2011
M-45-05-T10	INITIATE TANK RETRIEVAL FROM 12 ADDITIONAL SINGLE-SHELL TANKS.	9/30/2012
M-45-05-T11	INITIATE TANK RETRIEVAL FROM 14 ADDITIONAL SINGLE-SHELL TANKS.	9/30/2013
M-45-05-T12	INITIATE TANK RETRIEVAL FROM 17 ADDITIONAL SINGLE-SHELL TANKS.	9/30/2014
M-45-05-T13	INITIATE TANK RETRIEVAL FROM 20 ADDITIONAL SINGLE-SHELL TANKS.	9/30/2015
M-45-05-T14	INITIATE TANK RETRIEVAL FROM 20 ADDITIONAL SINGLE-SHELL TANKS.	9/30/2016
M-45-05-T15	INITIATE TANK RETRIEVAL FROM 20 ADDITIONAL SINGLE-SHELL TANKS.	9/30/2017
M-45-06	<p>COMPLETE CLOSURE OF ALL SINGLE-SHELL TANK FARMS IN ACCORDANCE WITH APPROVED CLOSURE/POST CLOSURE PLAN(S).</p> <p>THE SINGLE SHELL TANK CLOSURE WORK PLAN WILL BE PREPARED DESCRIBING THE WORK INTEGRATION PROCESS FOR SINGLE SHELL TANK CLOSURES AND STATUS OF WORK AND INTEGRATION PROCESS. KNOWN ISSUES WILL BE IDENTIFIED AND AN EXPLANATION WILL BE GIVEN ON HOW THESE ISSUES ARE BEING ADDRESSED. THIS WORK PLAN WILL BE PROVIDED TO ECOLOGY FOR REVIEW/COMMENT AND WILL BE USED AS A ROADMAP FOR CLOSURE OF THE SINGLE SHELL TANKS. BECAUSE OF THE UNCERTAINTIES IN THE CLOSURE PROCESS, THE WORK PLAN WILL EVOLVE AS THESE UNCERTAINTIES ARE RESOLVED AND EVENTUALLY IT WILL BECOME THE SST CLOSURE/POST CLOSURE PLAN(S) ISSUED FOR ECOLOGY'S APPROVAL UNDER SUBSEQUENT TPA INTERIM MILESTONES. MAJOR WORK AREAS COVERED IN THE WORK PLAN WILL INCLUDE WASTE RETRIEVAL, OPERABLE UNITS CHARACTERIZATION, TECHNOLOGIES DEVELOPMENT TO SUPPORT CLOSURE, REGULATORY PATHWAY AND STRATEGY FOR ACHIEVING CLOSURE.</p>	9/30/2024
M-45-06-T04	SUBMIT TANK CLOSURE/POST CLOSURE PLAN FOR SELECTED CLOSURE DEMONSTRATION OPERABLE UNIT OR TANK FARM TO ECOLOGY FOR APPROVAL.	11/30/2004
M-45-06-T05	<p>SUBMIT TANK FARM CLOSURE/POST-CLOSURE WORKPLAN UPDATE.</p> <p>BECAUSE OF THE UNCERTAINTIES IN THE CLOSURE PROCESS, THE WORK PLAN WILL EVOLVE AS THESE UNCERTAINTIES ARE RESOLVED AND EVENTUALLY IT WILL BECOME THE SST CLOSURE/POST CLOSURE PLAN(S) ISSUED FOR ECOLOGY'S APPROVAL UNDER SUBSEQUENT TPA INTERIM MILESTONES. MAJOR</p>	6/30/2002

Description/Justification of Change (Cont.)

	<p>WORK AREAS COVERED IN THE WORK PLAN WILL INCLUDE WASTE RETRIEVAL, OPERABLE UNITS CHARACTERIZATION, TECHNOLOGIES DEVELOPMENT TO SUPPORT CLOSURE, REGULATORY PATHWAY AND STRATEGY FOR ACHIEVING CLOSURE.</p> <p>THIS UPDATE OF THE MAY 1996 CLOSURE WORKPLAN WILL INCLUDE, BUT IS NOT LIMITED TO THE INCORPORATION OF:</p> <ul style="list-style-type: none"> <li>• DATA ACQUIRED DURING THE C-106 RETRIEVAL PROJECT (COMPLETED DURING FY2000),</li> <li>• RESULTS FROM RECENT ACTIVITIES FOCUSING ON MAXIMIZING RISK REDUCTION,</li> <li>• INFORMATION OBTAINED VIA VADOSE ZONE, GROUNDWATER MONITORING, AND RFI/CMS PROCESSES, AND</li> <li>• LESSONS LEARNED FROM THE AX FARM RPE.</li> </ul> <p>DOE'S TANK FARM CLOSURE/POST-CLOSURE WORKPLAN UPDATE WILL BE SUBMITTED TO ECOLOGY AS A PRIMARY DOCUMENT.</p>	
M-45-06-T06	<p>SUBMIT TANK FARM CLOSURE/POST CLOSURE WORKPLAN UPDATE.</p> <p>THIS UPDATE OF THE 6/30/02 CLOSURE WORKPLAN WILL INCLUDE, BUT IS NOT LIMITED TO THE INCORPORATION OF:</p> <ul style="list-style-type: none"> <li>• NEWLY AVAILABLE DATA,</li> <li>• A MORE DETAILED ASSESSMENT OF THE POINT OF COMPLIANCE AND RISK INFORMATION,</li> <li>• UPDATED DATA FROM VADOSE ZONE AND GROUNDWATER CHARACTERIZATION AND MONITORING,</li> <li>• NEW INFORMATION FROM M-45 SERIES RETRIEVAL ACTIONS COMPLETED TO DATE.</li> </ul> <p>THE CLOSURE/POST CLOSURE WORKPLAN WILL BE SUBMITTED TO ECOLOGY AS A PRIMARY DOCUMENT.</p>	6/30/2004
M-45-06-T07	<p>SUBMIT TANK FARM CLOSURE/POST CLOSURE WORKPLAN UPDATE.</p> <p>THIS UPDATE OF THE 6/30/04 CLOSURE WORKPLAN WILL INCLUDE, BUT IS NOT LIMITED TO THE INCORPORATION OF:</p> <ul style="list-style-type: none"> <li>• DATA OBTAINED FROM THE "LIMITS OF TECHNOLOGY" SALTCAKE TANK RETRIEVAL TECHNOLOGY DEMONSTRATION,</li> <li>• RESULTS FROM OTHER SST RETRIEVAL ACTIVITIES,</li> <li>• UPDATED DATA FROM VADOSE ZONE AND GROUNDWATER CHARACTERIZATION AND MONITORING,</li> <li>• RIVER PROTECTION PROJECT AGREEMENT REQUIREMENTS, INCLUDING WASTE TREATMENT COMPLEX PROCESSING CAPABILITY,</li> </ul> <p>CLOSURE/POSTCLOSURE WORKPLANS WILL BE SUBMITTED TO ECOLOGY AS PRIMARY DOCUMENTS.</p>	6/30/2006 (And every two years thereafter)
M-45-06-T02	<p>ECOLOGY WILL ISSUE FINAL CLOSURE/POST CLOSURE PLAN FOR SELECTED CLOSURE DEMONSTRATION OPERABLE UNIT OR TANK FARM.</p>	9/30/2006
M-45-06-T03	<p>INITIATE CLOSURE ACTIONS ON AN OPERABLE UNIT OR TANK FARM BASIS. CLOSURE SHALL FOLLOW COMPLETION OF THE RETRIEVAL ACTIONS UNDER PROPOSED MILESTONE M-45-05. CLOSURE WILL BE DEFINED IN AN APPROVED CLOSURE PLAN FOR THE DEMONSTRATION FARM. FINAL CLOSURE IS DEFINED AS REGULATORY APPROVAL OF COMPLETION OF CLOSURE ACTIONS.</p>	3/31/2012
M-45-06-T04	<p>COMPLETE CLOSURE ACTIONS ON ONE OPERABLE UNIT OR TANK FARM.</p>	3/31/2014
M-45-08	<p>ESTABLISH FULL SCALE CAPABILITY FOR MITIGATION OF WASTE TANK LEAKAGE DURING RETRIEVAL SLUICING OPERATIONS.</p>	6/30/2003
M-45-08A	<p>COMPLETE SYSTEM DESIGN AND OPERATING STRATEGY FOR TANK LEAK MONITORING AND MITIGATION FOR SYSTEMS TO BE USED IN CONJUNCTION</p>	12/31/2000

Description/Justification of Change (Cont.)

	WITH INITIAL RETRIEVAL SYSTEMS FOR SSTs.	
M-45-08B	COMPLETE DEMONSTRATION AND INSTALLATION OF LEAK MONITORING AND MITIGATION SYSTEMS FOR INITIAL SST RETRIEVAL.	6/30/2003
M-45-09E	SUBMIT ANNUAL PROGRESS REPORTS ON THE DEVELOPMENT OF WASTE TANK LEAK MONITORING/DETECTION AND MITIGATION ACTIVITIES IN SUPPORT OF M-45-08. REPORTS WILL PROVIDE A DESCRIPTION OF WORK ACCOMPLISHED UNDER M-45-08, TECHNOLOGIES, APPLICATIONS, COST SCHEDULE, AND TECHNICAL DATA. REPORTS WILL ALSO EVALUATE DEMONSTRATIONS PERFORMED BY DOE AND PRIVATE INDUSTRY FOR APPLICABILITY TO SST RETRIEVAL AND PROVIDE RECOMMENDATIONS FOR FURTHER TESTING FOR USE IN RETRIEVAL OPERATIONS.	9/30/2000
M-45-09F	SUBMIT ANNUAL PROGRESS REPORTS ON THE DEVELOPMENT OF WASTE TANK LEAK MONITORING/DETECTION AND MITIGATION ACTIVITIES IN SUPPORT OF M-45-08.  REPORTS WILL PROVIDE A DESCRIPTION OF WORK ACCOMPLISHED UNDER M-45-08, TECHNOLOGIES, APPLICATIONS, COST, SCHEDULE, AND TECHNICAL DATA. REPORTS WILL ALSO EVALUATE DEMONSTRATIONS PERFORMED BY DOE AND PRIVATE INDUSTRY FOR APPLICABILITY TO SST RETRIEVAL AND PROVIDE RECOMMENDATIONS FOR FURTHER TESTING FOR USE IN RETRIEVAL OPERATIONS.	9/30/2001
M-45-09G	SUBMIT ANNUAL PROGRESS REPORTS ON THE DEVELOPMENT OF WASTE TANK LEAK MONITORING/DETECTION AND MITIGATION ACTIVITIES IN SUPPORT OF M-45-08.  REPORTS WILL PROVIDE A DESCRIPTION OF WORK ACCOMPLISHED UNDER M-45-08, TECHNOLOGIES, APPLICATIONS, COST, SCHEDULE, AND TECHNICAL DATA. REPORTS WILL ALSO EVALUATE DEMONSTRATIONS PERFORMED BY DOE AND PRIVATE INDUSTRY FOR APPLICABILITY TO SST RETRIEVAL AND PROVIDE RECOMMENDATIONS FOR FURTHER TESTING FOR USE IN RETRIEVAL OPERATIONS.	9/30/2002
M-45-09H	SUBMIT ANNUAL PROGRESS REPORTS ON THE DEVELOPMENT OF WASTE TANK LEAK MONITORING/DETECTION AND MITIGATION ACTIVITIES IN SUPPORT OF M-45-08.  REPORTS WILL PROVIDE A DESCRIPTION OF WORK ACCOMPLISHED UNDER M-45-08, TECHNOLOGIES, APPLICATIONS, COST, SCHEDULE, AND TECHNICAL DATA. REPORTS WILL ALSO EVALUATE DEMONSTRATIONS PERFORMED BY DOE AND PRIVATE INDUSTRY FOR APPLICABILITY TO SST RETRIEVAL AND PROVIDE RECOMMENDATIONS FOR FURTHER TESTING FOR USE IN RETRIEVAL OPERATIONS.	9/30/2003 and annually thereafter
M-45-12-T01	SUBMIT AN OPTIONS REPORT DOCUMENTING DOE ASSESSMENT OF ACTIONS THAT COULD BE TAKEN TO INCREASE AVAILABLE TANK SPACE FOR SST WASTE RETRIEVAL.  THIS REPORT WILL EVALUATE AND DOCUMENT OPTIONS FOR ACQUIRING ADDITIONAL STORAGE SPACE FOR SST RETRIEVAL IN ADDITION TO THAT REQUIRED UNDER THIS M-45-00-01A CHANGE REQUEST. PRINCIPLE ACTIONS REQUIRED TO IMPLEMENT EACH OPTION WITHIN A REASONABLE TIME WILL BE IDENTIFIED. THE PRINCIPLE OPTIONS WILL HAVE DETAILED COST AND SCHEDULES FOR IMPLEMENTATION.	2/28/2002

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## **APPENDIX TO CHANGE REQUEST M-45-93-01 ~~H~~ SINGLE SHELL TANK WASTE RETRIEVAL CRITERIA PROCEDURE**

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**Note:** This procedure was originally appended to Agreement Change Request M-45-93-01, but will now be added as Appendix H to the Agreement. The ~~strikeout~~ and ~~shading~~ represent text to be deleted and added to the original procedure.

### **SINGLE SHELL TANK WASTE RETRIEVAL CRITERIA PROCEDURE<sup>1</sup>**

#### **INTRODUCTION**

The purpose of this procedure is to establish a means to set, evaluate, and revise criteria for determining the allowable residual waste following waste retrieval operations on the Hanford single shell tanks (SST).

The format for this procedure is to progress through a series of steps as depicted in the generic logic diagram displayed as Figure 1. Each step is briefly outlined and includes elements that constitute completion of the step.

#### **DEFINITION OF TERMS SPECIFIC TO WASTE RETRIEVAL ACTIVITIES:**

**Residual Waste:** Tank waste remaining in the tank after all waste retrieval actions have been completed. Some materials may be excluded from residual waste volume calculations, subject to approval in the closure plan.

#### **Step 1 : Establish Goal**

This initial step establishes the goal (the standard) for waste retrieval percentage and the method to be used to calculate the allowable residual waste volume following completion of retrieval operations. The calculation method is dependent on the variable to be measured (total tank waste inventory), and closure criteria and strategy. The proposed residual waste volume calculation method is shown in Attachment 1. A retrieval goal has been established as defined in milestone M-45-00.

#### **Step 2 : Evaluate Major Assessment Areas**

Once the goal has been established, it is assessed against two major areas, which are:

- a) SST Demonstration: Demonstrate achievability of waste retrieval goal during tank 241-S-112 and 241-C-1046 tank retrieval demonstrations. These will demonstrate retrieval of both saltcake and sludge/hard heel wastes as well as tanks in both 200 East and 200 West areas. Experience gained during AX-104, C-106 and earlier past practice sluicing shall be the reference baseline for past practice sluicing. Demonstrations will include the reference SST retrieval technologies. The effectiveness of the retrieval operation will be determined with a topographical measurement of remaining waste in the tank, and a

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<sup>1</sup> This procedure was originally appended to Change Request M-45-93-01.

## **APPENDIX TO CHANGE REQUEST M-45-93-01 H - SINGLE SHELL TANK WASTE RETRIEVAL CRITERIA PROCEDURE**

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calculation of waste inventory. The inventory calculation will be based on calculated volume of the tank, waste topography measurements with appropriate surveying techniques, and include adjustments for any detectable deformities in the tank structure (i.e., liner bulges). This technique will be demonstrated and calibrated in this retrieval demonstration. Prepare input to the retrieval goal evaluation (step 3) to accommodate the retrieval operations and residual measurement demonstrations.

- b) Evaluate regulatory requirements of high-level waste (HLW) disposal from applicable rules, regulations and DOE Orders and the Nuclear Waste Policy Act (NWPA). Establish an interface with the Nuclear Regulatory Commission (NRC), and reach formal agreement on the retrieval and closure actions for single shell tanks with respect to allowable waste residuals in the tank and soil column. Prepare input to the retrieval goal evaluation (step 3) to accommodate the agreements on allowable residuals.

### **Step 3 : Tank Retrieval Demonstration Goal Compliance**

Perform a joint assessment by DOE, EPA, and Ecology of the retrieval goal, based on the inputs from Steps 1 and 2. Modify the retrieval goal to match the most restrictive case (i.e., the highest retrieval % requirement).

### **Step 4 : Tank Farm Retrieval Demonstration(s)**

Perform the Tank Farm Retrieval Demonstration(s) on the selected tank farm or initial set of single-shell tanks to be retrieved. Repeat the residual inventory measurement steps identified in the tank retrieval demonstration. Calculate the residual inventory for each tank, based on the formula and procedure in Attachment 1 to this Appendix.

### **Step 5 : Tank Farm Retrieval Demonstration Goal Compliance**

Perform a joint assessment by DOE, EPA, and Ecology of the retrieval goal, based on the tank farm retrieval demonstration results. Modify the goal to match best available technology. Notify NRC as required for compliance with Nuclear Waste Policy Act WPA. Establish formal criteria for retrieval of waste from the remaining SST's. Finalize closure plans for tank farms and obtain concurrence from regulatory agencies.

### **Step 6 : SST Retrieval**

Proceed with retrieval of waste from the remaining SSTs. The schedule reflects retrieval activities on a tank-by-tank basis. It also allows flexibility to retrieve tanks from various farms if desired to support safety issue resolution, pretreatment or disposal feed requirements, or other priorities. Completion of retrieval will be in accordance with approved closure plans.

## **APPENDIX TO CHANGE REQUEST M-45-93-01 H-3 SINGLE SHELL TANK WASTE RETRIEVAL CRITERIA PROCEDURE**

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### **Step 7 : Determine Residual Waste Percentage**

The waste residuals are calculated for each tank.

### **Step 8 : Retrieval Compliance Evaluation**

Compare residual waste in each tank with criteria. Document compliance with criteria via notification to appropriate regulatory agencies. If residual complies with criteria, proceed with final closure operations (step 14). If residuals do not comply with criteria, prepare a request for waiver to the appropriate regulatory agency (step 9).

### **Step 9 : Petition for Regulatory Waiver**

An assessment is made as to the applicability of petitioning for regulatory waiver. This requires the review of relevant NRC license issues and possible closure plan modifications. Submit waivers to appropriate regulatory agencies.

### **Step 10 : Waiver Acceptance**

If a waiver is accepted, closure operations for the tank farm is initiated (Step 14). If the waiver is not accepted, additional retrieval operations are required. New technology may be needed (step 11). The waiver evaluation will consider the points on Attachment 2.

### **Step 11 : Additional Technology Available**

A review of alternate technologies will be performed relative to additional waste removal. If additional technologies are available, they will be deployed (step 12) and waste retrieval will resume. If additional technologies are not available, new technologies must be developed and deployed (steps 13 and 14). The tank farm will be held in interim status pending completion of the additional retrieval operations.

### **Step 12 : Deploy Technology and Perform Additional Retrieval**

If additional retrieval technology is available, it is deployed and additional waste retrieval operations are performed. After retrieval operation, the waste residual is again determined (Step 7), followed by the tank goal compliance evaluation (Step 8).

### **Step 13 : Develop New Technology**

If additional retrieval technology is not available, new technology is to be developed for the residue waste followed by deployment of the technology and additional waste retrieval operations (Step 12). After retrieval operation, the waste residual is again determined (Step 7), followed by the tank goal compliance evaluation (Step 8).



**APPENDIX TO CHANGE REQUEST M-45-93-01 ~~H-SINGLE SHELL TANK~~ WASTE  
RETRIEVAL CRITERIA PROCEDURE**

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**Step 14 : Closure Action**

When the tank farm retrieval and waste residual assessment process is complete the closure operations will start. Completion of the retrieval operations will be documented in accordance with the closure plans.

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RETRIEVAL CRITERIA PROCEDURE**

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**Attachment 1**

**WASTE RESIDUAL CALCULATION PROCEDURE, STEP 1**

**Calculate Residual Waste Volume**

1. Calculate Tank Volume
2. Measure/Calculate Waste Inventory via Topographical Mapping and Survey Techniques.
3. Retrieve Waste
4. Repeat Step 2.

**Calculation Method:**

For 75' Diameter Tanks (x) (~~Full Diameter Tank (x)~~), ~~e.g., 100 Series Tanks~~

$$\begin{aligned} \text{xbar gal} &= (100-A)\% (\text{Total Volume of Waste}/133 \text{ Tanks}) = \text{Allowable Average Residual} \\ &\quad \text{in full diameter tanks} \quad \text{per Tank} \\ &= (1.00-.99)(4,788,000 \text{ cu ft})/133 = 360 \text{ cu ft} \end{aligned}$$

where A% \* = Goal or criteria for waste retrieval percentage.

For Small Diameter Tank (y), ~~e.g., 200 Series Tanks~~

$$\begin{aligned} \text{ybar gal} &= (100-A)\% (\text{Total Volume of Waste}/16 \text{ Tanks}) = \text{Allowable Average Residual} \\ &\quad \text{in small diameter tanks} \quad \text{per Tank} \\ &= (1.00-.99)(48,000 \text{ cu ft}/16) = 30 \text{ cu ft} \end{aligned}$$

where A% \* = Goal or criteria for waste retrieval percentage.

\* Goal is 99% waste retrieval as defined in M-45-00 in equivalent volumetric measures.

**APPENDIX TO CHANGE REQUEST M-45-93-01 H-SINGLE SHELL TANK WASTE  
RETRIEVAL CRITERIA PROCEDURE**

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**Attachment 2**

**EXCEPTION TO RETRIEVAL CRITERIA FOR SINGLE-SHELL TANKS**

The DOE shall retrieve tank waste in accordance with criteria defined in milestone M-45-00. This recovery criteria will be applied to each tank on a tank-by-tank basis. If the DOE does not believe that this criteria is achievable for a specific tank, DOE shall submit a request for an exception to EPA and Ecology. The request shall include, at minimum, the following information:

1. The reason DOE does not believe the retrieval criteria can be met.
2. The schedule, using existing technology, to complete retrieval to the criteria - if possible.
3. The potential for future retrieval technology developments that could achieve the criteria, including estimated schedules and costs for development and deployment.
4. The volume of waste proposed to be left in place, and it's chemical and radiological characteristics.
5. Expected impacts to human health and the environment if the residual waste is left in place.
6. Additional information as required by EPA and/or Ecology.

The above information shall be submitted within 120 days of the decision by DOE that continued retrieval actions will not result in further waste removal. Upon receipt, EPA and Ecology shall provide a response within 60 days, in which they will either approve the exception to the criteria, in which case retrieval will be considered complete for the tanks in question, or they will deny the request. If the request is denied the DOE must continue to attempt to retrieve the tank wastes until the criteria is met for the tank, or they may choose to enter into the RCRA dispute resolution procedures of the Agreement. If an exception to the criteria is approved, the closure plan for the SSTs must be modified to address the remaining residual waste.

# **APPENDIX TO CHANGE REQUEST M-45-93-01 H- SINGLE SHELL TANK WASTE RETRIEVAL CRITERIA PROCEDURE**

**Figure 1. Process for Assessing Percentage of Waste Retrieved from Waste Retrieval Operations**

